



US009127833B2

(12) **United States Patent**  
**Shapiro et al.**

(10) **Patent No.:** **US 9,127,833 B2**

(45) **Date of Patent:** **Sep. 8, 2015**

(54) **POST MOUNTED DISPENSING DEVICE**

(71) Applicant: **The Schawbel Corporation**, Bedford, MA (US)

(72) Inventors: **Stephen Shapiro**, Wilmington, MA (US); **Wender Wang**, Arlington, MA (US)

(73) Assignee: **Thermacell Repellents, Inc.**, Bedford, MA (US)

(\* ) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **14/016,526**

(22) Filed: **Sep. 3, 2013**

(65) **Prior Publication Data**

US 2014/0063782 A1 Mar. 6, 2014

**Related U.S. Application Data**

(60) Provisional application No. 61/695,803, filed on Aug. 31, 2012.

(51) **Int. Cl.**

**F21V 33/00** (2006.01)  
**A01M 29/12** (2011.01)

(52) **U.S. Cl.**

CPC ..... **F21V 33/006** (2013.01); **A01M 29/12** (2013.01)

(58) **Field of Classification Search**

CPC ..... **A01M 29/12**; **F21V 33/006**  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

2008/0080174 A1\* 4/2008 Xu ..... 362/152  
2009/0294553 A1\* 12/2009 Wang et al. .... 239/135

**FOREIGN PATENT DOCUMENTS**

WO WO 2007000025 A1 \* 1/2007 ..... B65F 7/00

\* cited by examiner

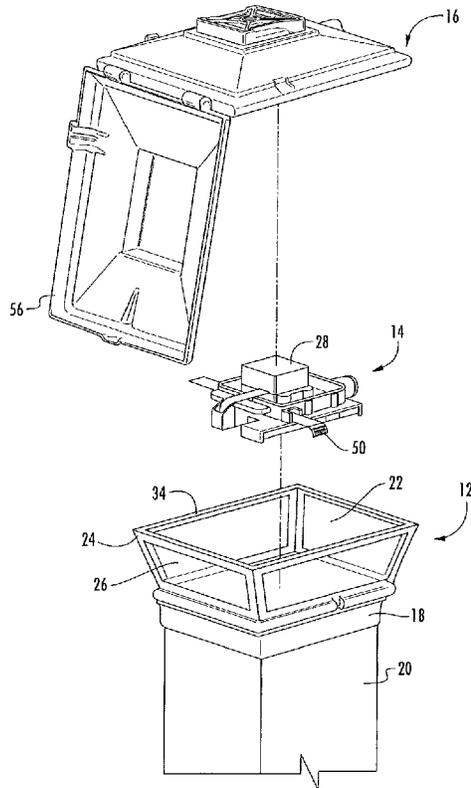
*Primary Examiner* — Elmito Breval

(74) *Attorney, Agent, or Firm* — Levisohn Berger LLP

(57) **ABSTRACT**

A unit for dispensing repellent that is mounted on a fence post. The unit also has a lighting system for illuminating an area. The dispensing system and lighting system are operable independently of each other.

**16 Claims, 7 Drawing Sheets**



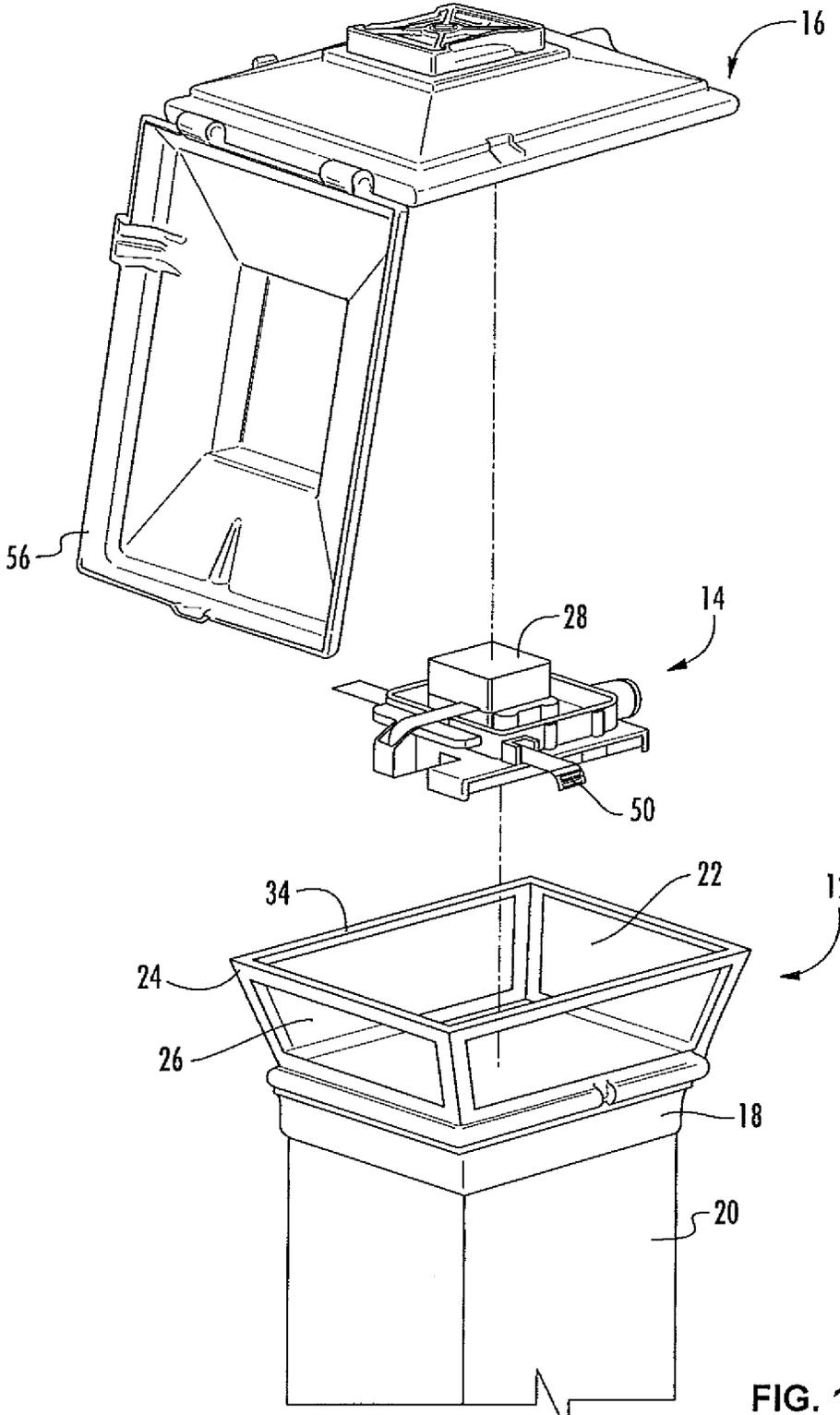


FIG. 1

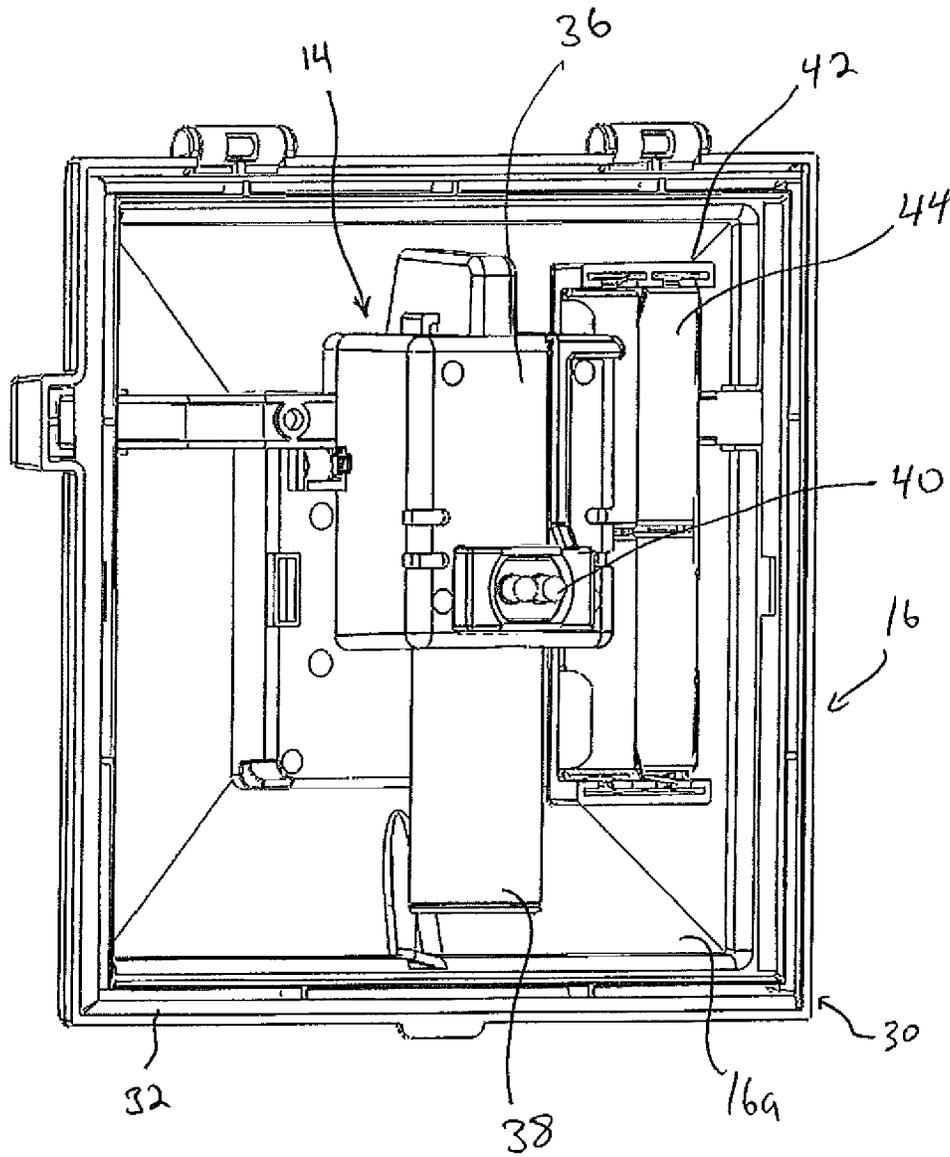


FIG. 2

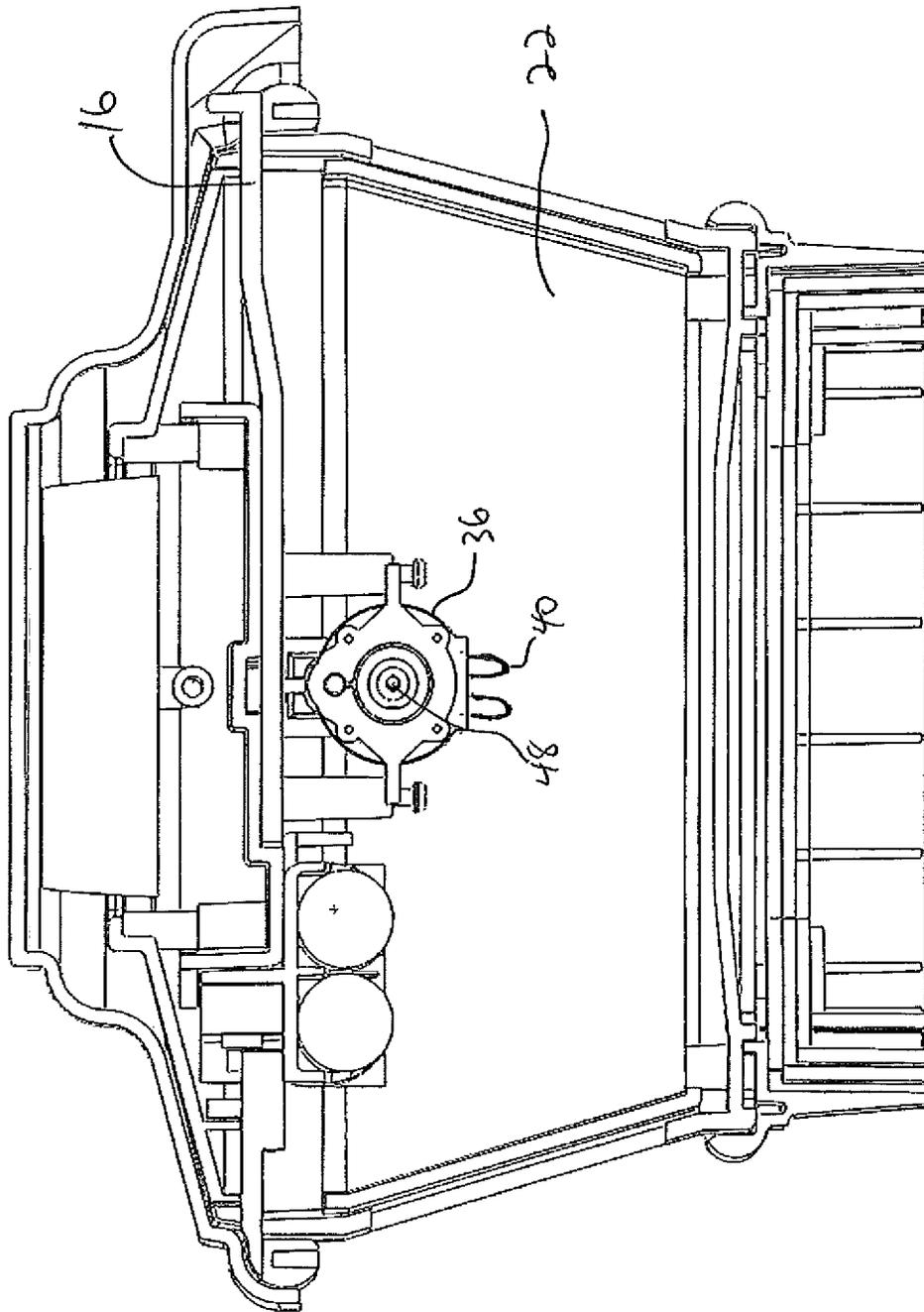


FIG. 3

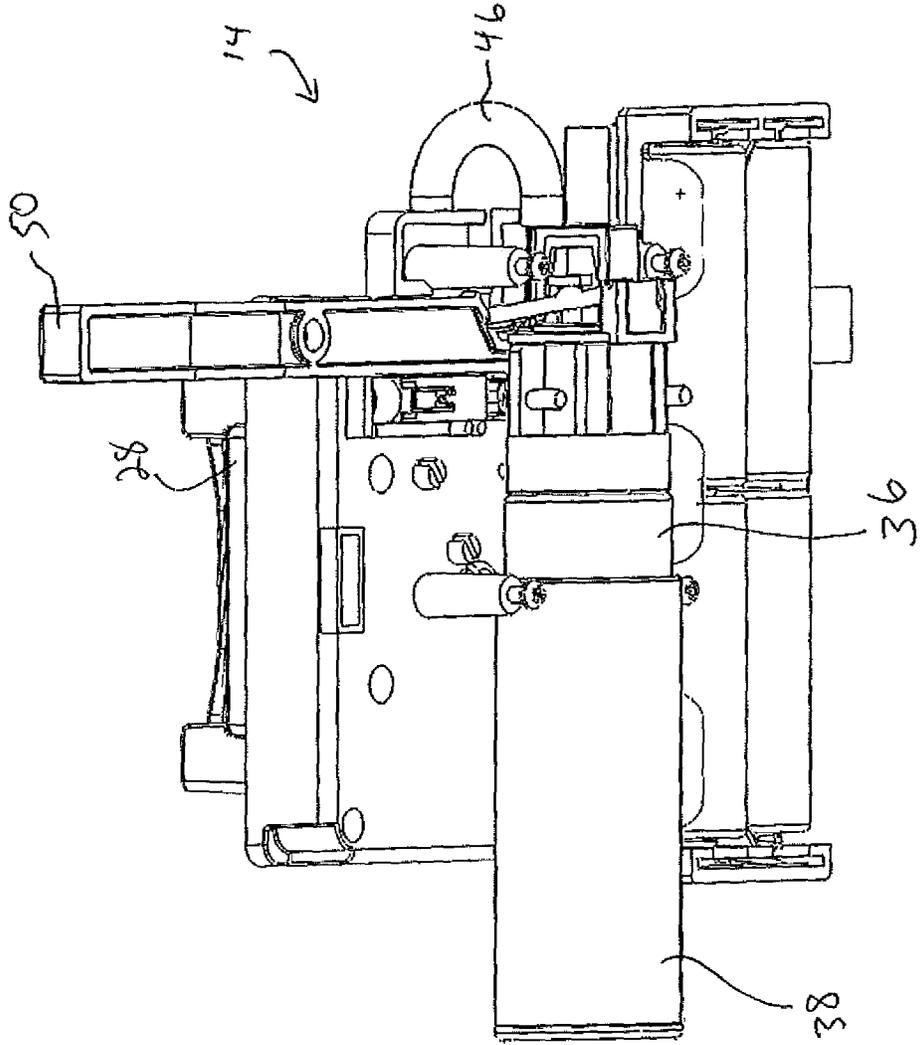


FIG. 4

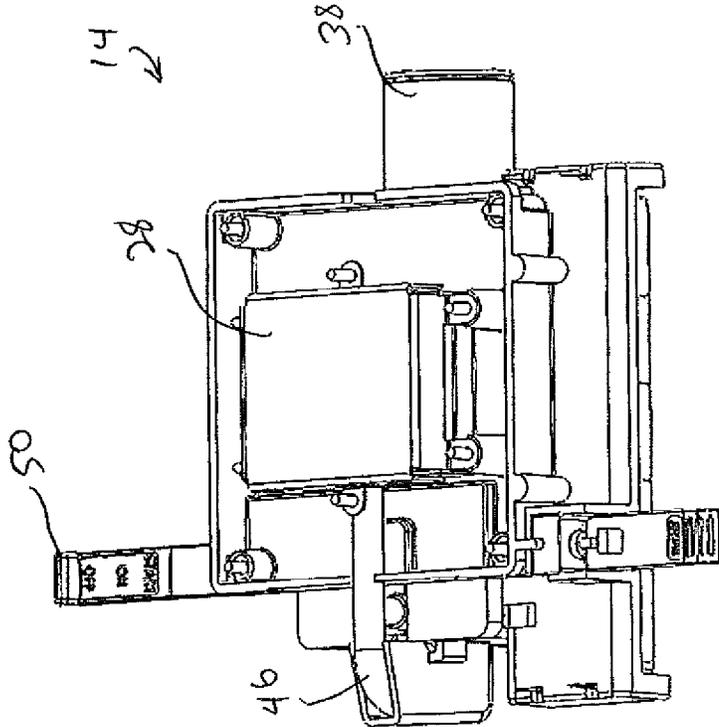


FIG. 5

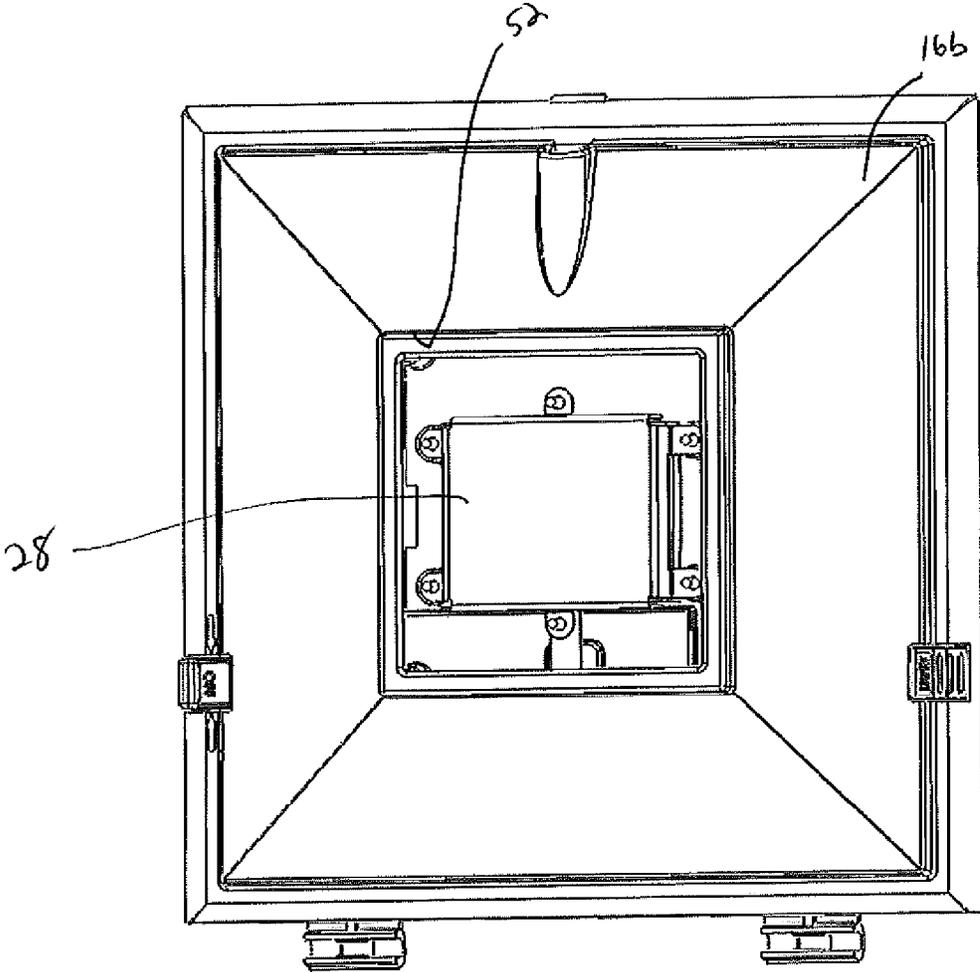


FIG. 6

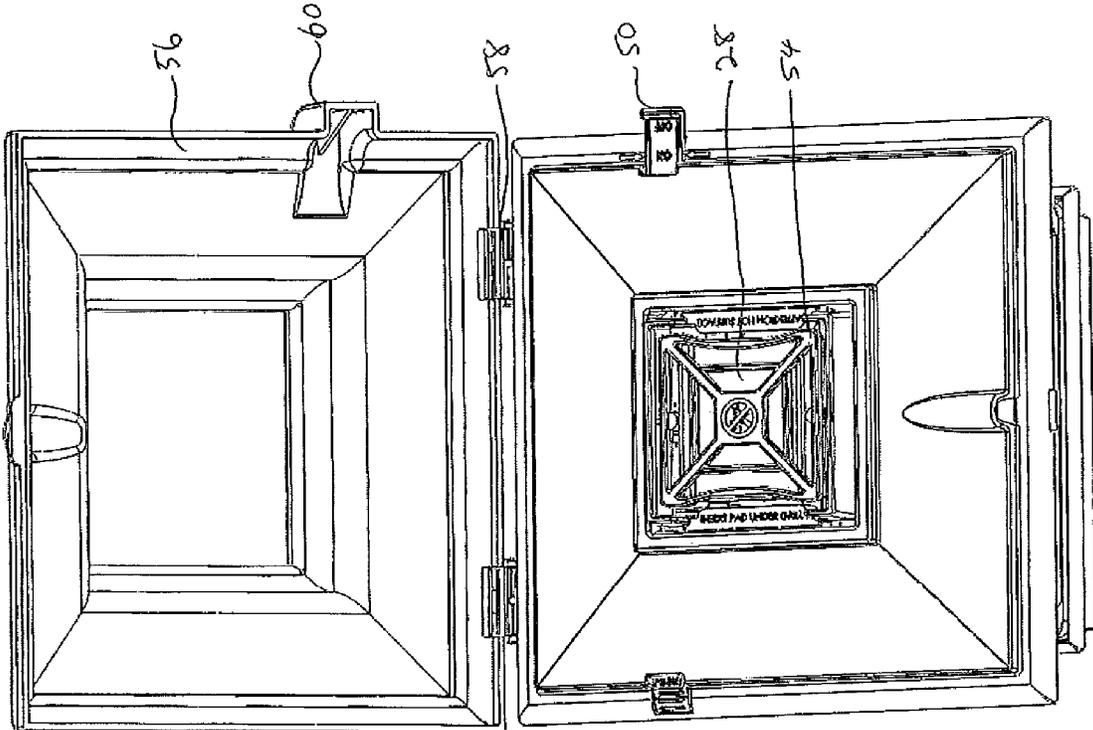


FIG. 7

## POST MOUNTED DISPENSING DEVICE

## RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Appl. Ser. No. 61/695,803 filed on Aug. 31, 2012 (Sep. 3, 2013 is the first non-holiday after Aug. 31, 2013)—the contents of which are incorporated by reference herein.

## FIELD OF THE INVENTION

The present invention relates generally to devices for dispensing volatile active substances. More particularly, the invention relates to a dispensing device that is mountable to a deck or fence post.

## BACKGROUND OF THE INVENTION

Handheld, portable devices that utilize heat to evaporate or volatilize active ingredients or other volatile substances are well known in the prior art. Such devices are commonly used to dispense insect control active ingredients or air treatment materials, such as air fresheners. Users employ these devices in a variety of places, such as in their backyards, near swimming pools or patios and the like.

However, portable handheld devices are susceptible to getting lost and damaged. Moreover, if they are left on the ground they may be tipped over or accessed by a child or pet. There is, thus, a need in the art for a permanently affixed or mounted dispensing device, which remains secured and out of harm's way.

## SUMMARY OF THE INVENTION

The current invention addresses these problems by providing a dispensing device that is mounted in or on a fence post commonly used around decks, yards, pools and the like. The dispensing device is affixed or integral to the post and, as such, the dispensing unit is in a safer and more permanent environment than conventional handheld, portable dispensers.

The manner in which volatilizable substances are dispensed in the current invention is fundamentally the same as prior dispensers invented by the instant inventors. Namely, a conductive heat plate is provided—upon which a mat impregnated with a volatilizable substance is placed. When the heat plate is sufficiently heated—the volatilizable substances evaporate and are thereby dispensed.

The dispensing device also has a built-in lighting system. The lighting system is comprised of a light emitting device, such as one or more light bulbs and/or LEDs—which are powered by electrical current (either hard wired electric cord or by way of batteries). The lighting system and the dispensing function are independently operable and independently controllable.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an exploded view of a globe, mechanical elements that are to be inserted therein and a cover thereon according to an embodiment of the invention.

FIG. 2 is a bottom view of a face plate having mechanical elements thereon according to an embodiment of the invention.

FIG. 3 is a cross-sectional view through a light/dispensing unit according to an embodiment of the invention.

FIG. 4 is an enlarged bottom, perspective of mechanical elements shown without an underlying face plate according to an embodiment of the invention.

FIG. 5 is an enlarged top, perspective of mechanical elements shown without an overlying face plate according to an embodiment of the invention.

FIG. 6 is a top view of a post cap repellent dispenser according to an embodiment of the invention.

FIG. 7 is a top view of post cap repellent dispenser having a protective grill and a cover according to an embodiment of the invention.

## DETAILED DESCRIPTION OF THE INVENTION

Embodiments of the present invention will now be described with reference to the above-identified Drawings. However, the Drawings and the description herein of the invention are not intended to limit the scope of the invention. It will be understood that various modifications of the present description of the invention are possible without departing from the spirit of the invention. Also, features described herein may be omitted, additional features may be included, and/or features described herein may be combined in a manner different from the specific combinations recited herein, all without departing from the spirit of the invention.

FIG. 1 shows an exploded view of a fence post dispenser showing a globe 12, some of the dispenser/light components 14 and a face plate 16. As shown, globe 12 is seated on a rectangular post cap frame 18. The post cap frame 18 has a bottom lip, which surrounds and grips the outside walls of a fence post 20. Post cap frame 20 also has a recessed track (not shown) on its top surface that is sized and shaped to receive and secure the bottom walls of globe 12 in order to secure the globe 12 to the fence post 20.

In a preferred embodiment, and as shown, the walls of the globe 12 angle outwardly as they extend upwardly from the cap frame 18. The globe walls preferably consist of a frame 24 that surrounds a window pane 26. Window pane 26 is made of a transparent or translucent material such as plastic, thermo-plastic, glass, Plexiglas® or such similar material. The four walls of the globe connect to form an inner housing 22 or cavity. The tops of the frame 24 create an upper rim 34.

As shown, when assembled, the dispenser/light components 14 (alternatively “mechanical components”) are seated within the inner housing 22 of globe 12. A face plate 16 covers the top of the globe and in a preferred embodiment, the mechanical components are mounted to the underside of the face plate 16.

In a preferred embodiment, a heating plate 28 is positioned on the top side of the mechanical components 14 and a light source is positioned toward the bottom of the mechanical components 14. As such, when the face plate 16 is seated on the globe 12, the light source projects downward into the inner housing 22 of the globe 12 and the heating plate 28 projects upward toward the top of the device—allowing repellent to be dispensed into the air.

FIG. 2 shows a bottom view of a face plate 16 having mechanical components mounted thereon. That is, the dispenser components shown in FIG. 1 are mounted to the underside surface 16a of face plate. A tank connection assembly 36 is shown mounted substantially parallel to the underside surface 16a of face plate 16. Tank connection assembly 36 is a pocket or similar enclosure for receiving a fuel tank 38. As shown, when the fuel cartridge 38 is inserted into the connection assembly 36—it is secured therein and held substantially parallel to the underside surface 16a of face plate 16. The fuel cartridge 38 is used to supply hydrocarbon fuel for combus-

tion in order to heat and thereby dispense volatilizable repellent. This aspect of the invention will be described in more detail below.

In addition to a dispensing system—there is also a lighting system that is used as an outdoor light—independent of the dispensing system. As shown, also provided on underside surface **16a** of face plate **16** are one or more light bulbs or LEDs **40** that project therefrom and a battery compartment **42** for receiving one or more batteries. Batteries **44** shown in the battery compartment provide electric current to power the bulb or LEDs. In the embodiment shown in FIG. 2, the LEDs are mounted to a tank connection assembly **36**, but in other embodiments of the invention, LEDs or bulbs may be mounted in other areas of the underside surface **16a** of face plate **16**.

As shown, a frame **30** having an outer lip **32** surrounds face plate **16**. The frame **30** is designed to be seated on the upper rim **34** of globe **12**. When plate **16** is seated on globe **12**, the LEDs **40** project into the cavity **22** of the globe and radiate light therefrom. The heating plate **28** projects upward to be accessible from the top of the unit. FIG. 3 shows a cross-sectional view of a dispensing unit where the face plate **16** and attached mechanical components **14** is seated on the globe **12**. A tank connection assembly **35** is shown positioned in the cavity **22** of the globe **12**.

Light bulbs **40** are shown projecting downward into the cavity **26** and which are used to illuminate the globe.

FIG. 4 shows a bottom, perspective view of the mechanical components **14** (without a face plate) of the dispensing system according to an embodiment of the invention. In use, the tank connection assembly **36** and fuel cartridge **38** are placed face down into the globe, whereas, the heating plate is oriented face up on the top of the unit. FIG. 5 shows a top, perspective view of the mechanical components **14**. As shown, the heating plate **28** faces up and is oriented to receive a pad impregnated with repellent.

In order to supply constant energy to the heat source, a fuel cartridge (or an electronic cartridge in other embodiments of the invention) must be secured and positioned for dispensing fuel to a combustion nozzle (or electric current to heating element). To that end, a tank connection assembly **36** is (affixed directly or indirectly to the underside **16a** of face plate **24**) which is adapted to receive a fuel cartridge **38**. In one embodiment, tank connection assembly **36** resembles a tunnel. A threaded attachment receptacle is provided inside the tunnel for threadedly engaging a correspondingly threaded fuel tank.

It will be understood that a hydrocarbon heat source to volatilize repellent is exemplary and any of various heat sources are within the teaching of the invention. For example, a heating element powered by a battery may be used to heat insect repellent. Moreover, it will be understood that the dispersal of any of various active ingredients or other volatile substances, such as fragrances and the like are within the teaching of the invention.

In the embodiment of the invention shown in FIG. 4, the tank receptacle is positioned substantially parallel to the undersurface **16a** of the plate—thereby receiving a cartridge oriented in substantially the same plane as undersurface **16a**. In other embodiments of the invention, the cartridge may be held in an orientation that is orthogonal to face plate **16**. That is, the cartridge could extend downward into the globe like the LEDs shown in FIG. 3. In other embodiments of the invention, the cartridge **38** may be oriented at other angles such as a roughly 45° with respect to plate **16**.

The cartridge **38** contains a hydrocarbon fuel such as butane. Fuel flowing from the fuel cartridge is delivered to a

venturi tube, which has an opening for the intake of air to create a fuel/air mixture. The fuel/air mixture is accelerated into a combustion nozzle, where an ignition system initiates hydrocarbon combustion. In one embodiment of the invention a piezoelectric device is used to generate a spark in order to ignite such hydrocarbon combustion.

In embodiments of the invention, the hydrocarbon fuel source is utilized for dispensing volatilizable substances is one disclosed in any of U.S. Pat. Nos. 4,699,123, 4,759,343 and 4,815,441—each of which is incorporated by reference herein.

Fuel flowing from cartridge **38** is delivered, by way of tube **46** to a combustion nozzle. Because the fuel cartridge **38** is located beneath and substantially parallel to the heating plate **28**, a tube is used to deliver fuel away from the cartridge and deliver it upward to a combustion nozzle located above the fuel cartridge. In one embodiment, a tube **46** that is in fluid communication with a fuel cartridge receives fuel therefrom. The tube **46** is then folded back on itself to deliver fuel to the combustion nozzle located beneath the heating plate. As shown, tube **46** captures fuel flowing out of the cartridge and then diverts the fuel upward and roughly 180° to the combustion nozzle. In order to prevent the tube **46** from collapsing, a spring **54** or such similar flexible supportive channel is inserted into the tube **46**.

It will be understood that the position of the cartridge **38** and the light bulbs or LEDs **40** as described are exemplary and their positions may be altered in different embodiments of the invention. For example, rather than being position on the face plate **16**—bulbs and or LEDs (or any similar light emitting device) may be positioned on the floor of the lamp cavity.

In a preferred embodiment of the invention, a valve activator system is provided to control the release of gas from cartridge **38**. In one embodiment the valve activator system comprises a plunger **48** (shown in FIG. 3) having one pointed end that is utilized to depress a fuel cartridge valve. The plunger is spring loaded with enough force to open the cartridge valve. A lever or similar connection to the plunger allows a user to release the plunger to move in the direction of the cartridge valve to open it and allow the free flow of fuel therefrom. Moving the lever so as to force the plunger away from the cartridge valve effectively turns off the flow of fuel.

In one embodiment of the invention, and as shown in FIGS. 4 and 5, the “on,” “off” and “ignition” functions are all controlled by a single lever. As shown, lever **50** has one end that contacts a plunger and a second end that extends out of the device to be accessible to a user. Lever **50** also is in close proximity to a piezoelectric device. A user pulls lever **50** a first distance to initiate the flow of fuel from the cartridge. The user then pulls lever **50** a second distance to activate the piezoelectric device. To turn off the dispenser, a user presses the lever back (two distances) to stop the flow of fuel.

Because the heating system and the lighting system have two different power sources and controls—they are each controllable independently of the other. That is, the lights, which are controlled by electric current such as batteries may be switched on or off whether or not the heating system is engaged—and vice versa. This allows a user to use the lamp as a conventional lamp, as an active ingredient dispenser or as both simultaneously.

FIG. 6 shows a top view of the dispensing unit. The top surface **16b** of face plate **16** is shown having a central substantially rectangular cutout **52**. Heating plate **28** is shown below the cutout and substantially parallel to face plate **16**. Heating plate **28** is made out of a thermally conductive material—such as aluminum, copper or the like. A burner or similar combustion nozzle (not shown) located beneath the heat-

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ing plate **28** and in thermal communication therewith heats the heating plate. The heating plate **28** reaches a sufficient temperature to heat a pad that is impregnated with volatilizable substance and thereby cause the substance to be disbursed into the air. In one embodiment of the invention and as shown in FIG. 7, a grill **54** is secured over the cutout **52** to protect a user from the direct contact with the heating plate **28**. The grill **54** allows access to the heating plate **28** through a slit or similar aperture so that a user may place a pad thereon. Once volatilized, repellant passes through the spaces in the grill **54** and is disbursed into the surrounding ambient air.

Referring to FIG. 7, in an embodiment of the invention a decorative/protective cover **56** is attached to dispensing device, for example, by way of one or more hinges **58** joining cover **56** to face plate **16**. In a preferred embodiment, a small pocket **60** extends from the side of the cover **56**. Pocket **60** has a sloped inside surface and as such when the cover is brought to a closed position, the sloping surface pushes lever **50** inward—thereby turning off the unit. As described above, moving the lever inward pushes the plunger away from the cartridge, thereby, closing the cartridge valve and terminating gas flow. This serves an important safety feature, whereby heat source is automatically turned off upon closing the unit's lid—avoiding the risk of burning and/or melting the cover **56**.

Having described this invention with regard to specific embodiments, it is to be understood that the description is not meant as a limitation since further modifications and variations may be apparent or may suggest themselves to those skilled in the art. It is intended that the present application cover all such modifications and variations.

What is claimed is:

1. A dispensing apparatus, comprising:
  - a globe, said globe comprising walls, said walls forming an inner cavity, each of said walls comprising an outer frame surrounding a pane, whereby tops of said outer frames form an upper rim on said globe;
  - a face plate, said face plate having an upper surface and an underside surface, said face plate further comprising an outer lip surrounding said face plate, said outer lip being seated on said upper rim on said globe;
  - a tank connection assembly connected to said underside surface of said face plate;

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a light emitting device connected to said underside surface of said face plate, said light emitting device projecting downward into said inner cavity formed by said walls; a heating plate positioned on a top surface of said dispensing apparatus, whereby said heating plate is heated by heat source positioned below thereof; and a cover being connected to said face plate by way of one or more hinges.

2. The dispensing apparatus of claim 1, whereby said light emitting device is a light bulb or an LED.

3. The dispensing apparatus of claim 2, whereby said light bulb or LED is powered by one or more batteries.

4. The dispensing apparatus of claim 2, whereby said light bulb or LED is powered by a hard-wired electric cord.

5. The dispensing apparatus of claim 1, whereby said connection assembly receives a fuel cartridge.

6. The dispensing apparatus of claim 5, further comprising a tube for carrying fuel from said fuel cartridge to a combustion nozzle.

7. The dispensing apparatus of claim 5, whereby said tube is bent approximately 180° to carry fuel to a combustion nozzle located on top of said fuel cartridge.

8. The dispensing apparatus of claim 1, whereby said face plate comprises a cutout in its general center.

9. The dispensing apparatus of claim 8, whereby said heating plate is accessible through said cutout.

10. The dispensing apparatus of claim 8, further comprising a grill positioned over said cutout.

11. The dispensing apparatus of claim 1, further comprising a lever for engaging and terminating said heat sources.

12. The dispensing apparatus of claim 1, wherein said cover further comprises a pocket, said pocket aligning with a lever, whereby when said cover is placed over said face plate, said pocket contacts said lever and moves it.

13. The dispensing apparatus of claim 12, whereby movement of said lever stops the flow of fuel.

14. The dispensing apparatus of claim 1, whereby said light emitting device and said heat source are independently controllable.

15. The dispensing apparatus of claim 1 being mounted to a fence post.

16. The dispensing apparatus of claim 15 further comprising a post cap frame for securing said globe to said fence post.

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